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ABSTRACT

The presence of the computer in the classroom is no longer considered an oddity; it has become an ordinary resource for teachers to use for the enhancement of instruction. This paper presents an examination of software infusion, i.e., the use of computer software to enrich instruction in an academic curriculum. The process occurs when a chosen software is incorporated within an overall teacher designed and implemented lesson plan. Some impediments to software infusion are discussed: (1) lack of quality software; (2) lack of sufficient software and/or hardware; (3) high cost of hardware and software; and (4) lack of teacher training. The elements of software infusion (relationship to objectives, integration into lesson design, range of applications, range of utilization strategies, use of specific capabilities of the computer, and computer literacy benefits) are described, and examples of software infusion in actual practice, as derived from the California Framework and Model Curriculum Guides in the specific subject areas of science, mathematics, history, and social science are included. (LL)

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ENHANCING INSTRUCTION THROUGH SOFTWARE INFUSION

ED 363 605

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Abstract

Software infusion (SI) refers to the use of computer software to enhance instruction in the academic curriculum. It occurs when a chosen software is incorporated within an overall teacher designed and implemented lesson plan. Some impediments to software infusion are: (1) lack of quality software, (2) lack of sufficient software and/or hardware, (3) high cost of hardware and software, and (4) lack of teacher training. After describing some elements of software infusion, examples of software infusion in several subject areas bring the concept of software infusion into reality.

I. Introduction

The presence of the computer in the classroom is no longer considered an oddity. It becomes an ordinary resource for teachers to use to enhance instruction. To maximize its effectiveness in the classroom, the computer needs the availability of quality software that teacher can use to enhance instruction along different subject areas. When a teacher specifically utilizes a software to enhance instruction in a specific subject, then he/she is putting software infusion (SI) into practice. This means that the teacher incorporates a selected software to achieve a specific lesson plan objective in any subject. Having several students work on a software of their choice to keep

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them busy may serve some purpose, but this is not software infusion envisioned above.

II. Impediments to SI

Despite its recognized merit, software infusion is still not as prevalent today as we want it to be. Schiffman (1990) lists four impediments to software infusion: (1) lack of quality software, (2) lack of sufficient software and/or hardware, (3) high cost of hardware and software, and (4) lack of teacher training. Added to the list is what Schiffman considers as a lack of "vision" to use computer as a teaching resource. Teachers may only have a vague notion that computers have some kind of instructional potential, instead of having a definite mental image of ways in which they can use software to enhance instructional effectiveness in their classrooms.

III. Elements of SI

What does software infusion look like? To aid teachers in understanding software infusion better, Schiffman (1990) offers the following elements that characterize the process:

1. *Relationship to Objectives.* Software used by the teacher is directly related to a stated objective of the curriculum.

2. *Integration into Lesson Design.* The software is not expected to teach the entire lesson. Use the software only where it can make the most significant contribution.

3. *Wide Range of Applications.* Any software that will help students achieve curriculum objectives is applicable.

4. *Wide Range of Utilization Strategies.* A computer may be used as an electronic chalkboard. One or more computers may be used as needed.

5. *Using Specific Capabilities of the Computer.* A software is used because it contributes something specific to the lesson.

6. *Computer Literacy Benefits.* Students may not only derive benefits with the content of the academic subject, but they also get hands-on experience with word processing, graphing, data base management, etc.

IV. Software Infusion in Practice

The above characteristics are considered in developing the following examples of how software infusion looks like in actual practice. The objectives noted here are derived from the California Framework and Model Curriculum Guides in science, mathematics, and history-social science.

1. Subject: *Mathematics*
   Grade: 3-4
   Objective: The students will describe rectangles, squares, and triangles by naming the number of sides, the number of corners and the number of square corners.

Using body movements, a third or fourth grade teacher demonstrates for his students the LOGO turtle commands of Forward, Back, Right, Left, Pen Up, Pen Down and how to instruct the turtle in distance and direction. The pupils

are then encouraged to have turtle draw rectangles and squares on the screen. The teacher goes around and checks their progress. Students who have been successful are encouraged to create a triangle on the same screen. The teacher gives hints when students have the opportunity to experiment.

2: Subject: *Mathematics*

Grade: 4-8

Objective: Students will describe and test different problem solving strategies.

The teacher leads students to understand that problem solving is a process, with solutions coming most often as the result of exploring situations, stating and restating questions, and devising and testing strategies. To concentrate on the latter point, the teacher gives a specific problem and leads students to describe the process and what strategies to use.

To further enhance students' understanding of problem solving strategies, the teacher makes available the *Math Shop* software for students' use. This program takes place in a three-story shopping mall, where students help busy proprietors serve their customers in the different stores. Each order gives practice in problem solving strategies such as trial-and-error, estimation, and looking for patterns.

3. Subject: *Reading*

Grade: K-2

Objective: Students will show reading comprehension by answering specific questions on a story just told/read.

The teacher (T) tells a story orally in class, using gestures and pictures as appropriate. Then T asks simple questions based on the story just told. T then uses *Kittens, Kids, and a Frog* reading comprehension software. This contains delightful stories and full- color graphics that provide children with carefully sequence practice in the development of both factual and inferential comprehension.

4. Subject: *Science*

Grade: 4-6

Objective: Students will explain how the organs of the human body form systems and describe how they carry essential body functions.

The teacher (T) helps students learn about a particular organ in the human body by asking them to "Inteview an Organ". T then asks them to select a particular organ or system of the body and lists its characteristics. Better still, T uses the software *The Body Transparent* where students locate organs and answer questions on organ functions and describe functions of body systems.

5. Subject: *Social Studies*

Grade: 6 up

Objective: Students will display locational skills and understanding.

In the study of geography, students use map and globe skills to determine absolute locations, measure distances between places, and interpret information available through the maps' legend, scales of miles, and symbolic representation. The teacher then leads students to use these skills in their study of the different states. To further reinforce these skills, the teacher utilizes the software *The Great Maine-to-California Race*. Working in pairs or individually, the students move one state at a time by answering geographical questions. Another sofware that would further enhance students' understanding of the geography of the different states is *States and Traits*. This is a drill and practice program for Grade 6 up.

Summing It Up

Software infusion has a tremendous potential in enhancing instruction along the different subject areas. What is called for is a teacher who shares the vision of utilizing the computer as a teaching resource and who incorporates its strength in lesson planning and implementation. A wide variety of software is waiting out there for teachers to explore and whose applications can contribute to the instructional effectiveness of lessons designed to teach specific curriculum objectives.

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